

AMENDMENTS TO THE CLAIMS

Claims 1-14 (Canceled)

Claim 15 (Currently Amended): A resin composition comprising ethylene-vinyl alcohol copolymer (A), a thermoplastic resin (B) other than the ethylene-vinyl alcohol copolymer (A), and a transition metal salt (C), wherein

the ethylene-vinyl alcohol copolymer (A) is contained in an amount of 70 to 99.9% by weight and the thermoplastic resin (B) is contained in an amount of 0.1 to 30% by weight,

an ethylene content ETa (mol%) and a degree of saponification SDa (%) of the ethylene-vinyl alcohol copolymer (A) satisfy the following equations (1) and (2):

$$25 \leq \text{ETa} \leq 55 \quad (1)$$

$$90 \leq \text{SDa} < 99 \quad (2), \text{ and}$$

the thermoplastic resin (B) comprises a carbon-carbon double bond other than an aromatic carbon-carbon double bond, and

the transition metal salt (C) is contained in a ratio of 1 to 5000 ppm in terms of metal element, based on a total weight of the ethylene-vinyl alcohol copolymer (A) and the thermoplastic resin (B).

Claim 16 (Currently Amended): A resin composition comprising ethylene-vinyl alcohol copolymer (A), a thermoplastic resin (B) other than the ethylene-vinyl alcohol copolymer (A), and a transition metal salt (C), wherein

the ethylene-vinyl alcohol copolymer (A) is contained in an amount of 70 to 99.9% by weight and the thermoplastic resin (B) is contained in an amount of 0.1 to 30% by weight,

the ethylene-vinyl alcohol copolymer (A) comprises at least two kinds of ethylene-vinyl alcohol copolymers (a1) and (a2),

ethylene contents ETa1 (mol%) and ETa2 (mol%) and degrees of saponification SDa1 (%) and SDa2 (%) of the ethylene-vinyl alcohol copolymers (a1) and (a2), respectively, satisfy the following equations (3) to (6):

$$25 \leq \text{ETa1} \leq 55 \quad (3)$$

$$90 \leq \text{SDa1} < 99 \quad (4)$$

$$25 \leq \text{ETa2} \leq 55 \quad (5)$$

$$99 \leq \text{SDa2} \quad (6),$$

a weight ratio (a1/a2) of the ethylene-vinyl alcohol copolymers (a1) and (a2) is 5/95 to 95/5, and

the thermoplastic resin (B) comprises a carbon-carbon double bond other than an aromatic carbon-carbon double bond, and

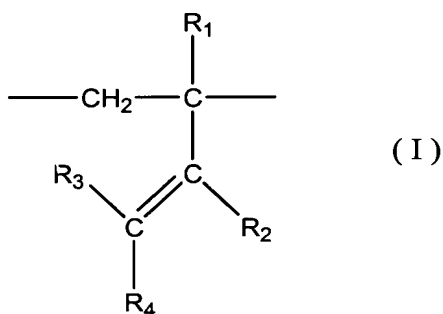
the transition metal salt (C) is contained in a ratio of 1 to 5000 ppm in terms of metal element, based on a total weight of the ethylene-vinyl alcohol copolymer (A) and the thermoplastic resin (B).

Claim 17 (Canceled)

Claim 18 (Original): The resin composition of claim 16, wherein the transition metal salt (C) comprises at least one transition metal selected from the group consisting of iron, nickel, copper, manganese, and cobalt.

Claim 19 (Original): The resin composition of claim 16, wherein the thermoplastic resin (B) comprises a carbon-carbon double bond in a ratio of 0.0001 eq/g or more.

Claim 20 (Original): The resin composition of claim 16, wherein the thermoplastic resin (B) comprises a unit represented by formula (I)



wherein  $\text{R}_1$  is a hydrogen atom or an alkyl group having 1 to 5 carbon atoms,  $\text{R}_2$  is a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an aryl group, an alkylaryl group, an arylalkyl group or an alkoxy group,  $\text{R}_3$  and  $\text{R}_4$  are each independently a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an aryl group that can be substituted,  $\text{---COOR}_5$ ,  $\text{---OCOR}_6$ , a cyano group or a halogen atom, and  $\text{R}_5$  and  $\text{R}_6$  are each independently an alkyl group having 1 to 10 carbon atoms, an aryl group, an alkylaryl group, an arylalkyl group or an alkoxy group.

Claim 21 (Previously Presented): The resin composition of claim 16, wherein a number average molecular weight of the thermoplastic resin (B) is 1000 to 500000.

Claim 22 (Original): The resin composition of claim 16, wherein the thermoplastic resin (B) comprises an aromatic vinyl compound unit and a diene compound unit.

Claim 23 (Original): The resin composition of claim 22, wherein the diene compound unit is at least one of an isoprene unit and a butadiene unit.

Claim 24 (Original): The resin composition of claim 22, wherein the aromatic vinyl compound unit is a styrene unit.

Claim 25 (Original): The resin composition of claim 22, wherein the thermoplastic resin (B) is a block copolymer.

Claim 26 (Original): The resin composition of claim 16, wherein the thermoplastic resin (B) is a styrene-isoprene block copolymer.

Claim 27 (Previously Presented): The resin composition of claim 16, wherein a difference in refractive index between the ethylene-vinyl alcohol copolymer (A) and the thermoplastic resin (B) is 0.01 or less, and wherein the refractive index of the ethylene-vinyl alcohol copolymer (A) is an average that is calculated based on the weight ratio of the at least two kinds of ethylene-vinyl alcohol copolymers (a1) and (a2).

Claim 28 (Original): The resin composition of claim 16, wherein particles of the thermoplastic resin (B) are dispersed in a matrix of the ethylene-vinyl alcohol copolymer (A).

Claim 29 (Currently Amended): A resin composition comprising ethylene-vinyl alcohol copolymer (A), a thermoplastic resin (B) other than the ethylene-vinyl alcohol copolymer (A), and a transition metal salt (C), wherein

the ethylene-vinyl alcohol copolymer (A) is contained in an amount of 70 to 99.9% by weight and the thermoplastic resin (B) is contained in an amount of 0.1 to 30% by weight,

the ethylene-vinyl alcohol copolymer (A) comprises at least two kinds of ethylene-vinyl alcohol copolymers (a1) and (a2),

ethylene contents ETa1 (mol%) and ETa2 (mol%) and degrees of saponification SDa1 (%) and SDa2 (%) of the ethylene-vinyl alcohol copolymers (a1) and (a2), respectively, satisfy the following equations (3) to (6):

$$25 \leq \text{ETa1} \leq 55 \quad (3)$$

$$90 \leq \text{SDa1} < 99 \quad (4)$$

$$25 \leq \text{ETa2} \leq 55 \quad (5)$$

$$99 \leq \text{SDa2} \quad (6),$$

a weight ratio (a1/a2) of the ethylene-vinyl alcohol copolymers (a1) and (a2) is 5/95 to 95/5,

the thermoplastic resin (B) comprises a carbon-carbon double bond other than an aromatic carbon-carbon double bond,

the transition metal salt (C) is contained in a ratio of 1 to 5000 ppm in terms of metal element, based on a total weight of the ethylene-vinyl alcohol copolymer (A) and the thermoplastic resin (B), and

an oxygen absorption rate of the resin composition is  $0.01 \text{ ml/m}^2 \cdot \text{day}$  or more.

Claims 30-33 (Canceled)

Claim 34 (Original): A multilayered structure comprising at least one layer made of the resin composition of claim 16.

Claim 35 (Original): A multilayered container comprising at least one layer made of the resin composition of claim 16 and at least one thermoplastic polyester layer.

Claim 36 (Original): The multilayered container of claim 35, wherein two thermoplastic polyester layers are arranged so as to be in direct contact with both surfaces of the layer made of the resin composition.

Claim 37 (Original): A coinjection blow molded container having a multilayered structure, in which two thermoplastic polyester layers are arranged so as to be in direct contact with both surfaces of a layer made of the resin composition of claim 16.

### SUPPORT FOR THE AMENDMENTS

This Amendment cancels Claims 1-14, 17 and 30-33; and amends Claims 15-16 and 29. Support for the amendments is found in the specification and claims as originally filed. In particular, the amendments regarding the contents of the ethylene-vinyl alcohol copolymer (A) and the thermoplastic resin (B) in Claims 15-16 are supported by the specification at least at page 26, lines 10-13. The amendments regarding the carbon-carbon double bond in Claims 15-16 and 29 are supported by the specification at least at page 16, lines 1-4. The amendments regarding the content of the transition metal salt (C) in Claims 15-16 and 29 are supported by the specification at least at page 25, lines 10-15. No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 15-16, 18-29 and 34-37 will be pending in this application. Claims 15, 16 and 29 are independent.

### REQUEST FOR RECONSIDERATION

Applicants respectfully request entry of the foregoing and reexamination and reconsideration of the application, as amended, in light of the remarks that follow.

The present invention provides a resin composition comprising ethylene-vinyl alcohol copolymer ("EVOH") (A), an additional thermoplastic resin (B), and a transition metal salt (C). The ethylene-vinyl alcohol copolymer (A) is contained in an amount of 70 to 99.9% by weight; the thermoplastic resin (B) is contained in an amount of 0.1 to 30% by weight; and the transition metal salt (C) is contained in a ratio of 1 to 5000 ppm. As a result of this combination, the resin composition has excellent gas barrier properties (i.e. low permeability) and excellent oxygen absorption properties (oxygen scavenging function). The oxygen absorption properties result from the presence of oxygen-reactive carbon-carbon double bonds in the thermoplastic resin (B).

In the present invention, the carbon-carbon double bond encompasses conjugated double bonds, but does not encompass multiple bonds contained in aromatic rings. Specification at page 16, lines 2-4.

The transition metal salt (C) improves the oxygen scavenging function of the resin composition by facilitating the reaction of carbon-carbon double bonds with oxygen.

Claims 1-3, 14-17, 27-30 and 34 are rejected under 35 U.S.C. § 102(e) over U.S. Patent No. 5,972,447 ("Hata").

Hata describes a resin composition and a multilayered structure, where the composition comprises two EVOH polymers and a thermoplastic resin such as ethylene-(meth)acrylic acid copolymer. Hata specifically describes in Examples 4-3 and 4-7 a multilayered container including a layer that comprises this composition and a layer of polystyrene (PS).

However, Hata is silent about a resin having a carbon-carbon double bond that is other than an aromatic carbon-carbon double bond, i.e., a resin having a carbon-carbon double bond that contributes to oxygen absorption. Thus, Hata fails to suggest the limitation of independent Claims 15-16 and 29 that "the thermoplastic resin (B) comprises a carbon-carbon double bond **other than an aromatic** carbon-carbon double bond".

Because Hata fails to suggest all the limitations of independent Claims 15-16 and 29, the rejection over Hata should be withdrawn.

Claims 1, 15 and 29 are rejected under 35 U.S.C. § 102(b) over EP 0 814 126 ("Hiroshi"). In addition, Claims 1-16 and 19-37 are rejected under 35 U.S.C. § 103(a) over Hiroshi in view of U.S. Patent No. 6,294,609 ("Bertin"). Claims 17-18 are rejected under 35 U.S.C. § 103(a) over Hiroshi in view of EP 0 854 166 ("Speer").

Hiroshi fails to suggest a resin composition that comprises EVOH (A), the thermoplastic resin (B), and the transition metal salt (C) in specific amounts and that has excellent oxygen absorption properties. Hiroshi merely discloses a composition in which



EVOH and a block copolymer are contained in a ratio of 25 to 99wt% and 1 to 75%, respectively. The block copolymer of Hiroshi is a copolymer containing an aromatic vinyl monomer unit and a polymer block containing an isobutylene unit. As discussed in the Supplemental Response filed February 25, 2004, this block copolymer does not have oxygen absorption properties. Furthermore, the composition of Hiroshi lacks the transition metal salt that is essential for oxygen absorption in the resin composition of claim 15. Therefore, even if the composition of Hiroshi contains another polymer such as isoprene rubber as described on page 8, line 13 of Hiroshi, the present invention cannot be realized from Hiroshi. This is because Hiroshi is silent about oxygen absorption properties, and thus fails to suggest the content of such a polymer that is required for an oxygen absorption function.

Bertin fails to describe a resin composition having oxygen absorption properties. Bertin merely describes a resin composition mainly comprising EVOH, a polyethylene, and acid grafted polyethylenes. See, e.g., Bertin at claim 1.

Thus, claim 15 of the present invention is completely different from Hiroshi. Furthermore, there is no motivation to combine Hiroshi and Bertin in order to obtain a resin composition having gas barrier properties and oxygen absorption properties. If combined, the resin composition of claim 15 would not have been realized from Hiroshi and Bertin.

Speer discloses an oxygen scavenging composition comprising an ethylenically unsaturated polymer and a transition metal catalyst. The objective of Speer is to obtain a composition suitable for scavenging oxygen, and thus the composition of Speer does not include EVOH that has gas barrier properties and will inhibit oxygen absorption. Therefore, those skilled in the art would not combine the composition of Speer having oxygen absorption properties with the composition of Hiroshi that includes EVOH having gas barrier properties. Furthermore, as mentioned above, Hiroshi is silent about oxygen absorption properties. Accordingly, there is no motivation, without hindsight reasoning, to combine

Hiroshi and Speer in order to obtain a composition having oxygen absorption properties and gas barrier properties.

Thus, Claim 15 is patentably over the cited prior art.

The resin composition of Claim 16 is the same as that of Claim 15 except that the EVOH is at least two kinds of EVOH, each having a specific ethylene content and a degree of saponification.

The subject matter of Claim 29 is the same as Claim 16 except that the subject matter of Claim 29 further includes the limitation that "an oxygen absorption rate of the resin composition is  $0.01 \text{ ml/m}^2 \cdot \text{day}$  or more".

Thus, independent Claims 16 and 29, in addition to independent Claim 15, are patentable over the cited prior art. Furthermore, Claims 17-18, 20-28 and 34-37, which depend from independent Claim 16, are also patentable over the cited prior art. Therefore, the various prior art rejections should be withdrawn.

Claims 7 and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Applicants respectfully traverse the rejection. The specification at page 52, line 23, explicitly discloses the limitation of Claims 7 and 21 of a "number average" molecular weight. Because Claims 7 and 21 do not contain new matter, the rejection under 35 U.S.C. 112, first paragraph, should be withdrawn.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is in condition for allowance. Applicants respectfully request favorable consideration and prompt allowance of the application.

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In reply to Office Action of May 6, 2004


Should the Examiner believe that anything further is necessary in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' representative at the telephone number listed below.

Respectfully submitted,

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